

In view of proposals to have community mental health centers undertake prevalence studies, the author offers a comprehensive and pertinent critique of such investigations, concluding that the chief task of epidemiological research is to determine incidence of psychiatric disorder, and to relate incidence to various characteristics so as to infer clues to etiology.

PROBLEMS IN STUDYING THE PREVALENCE OF PSYCHIATRIC DISORDER

Rema Lapouse, M.D., F.A.P.H.A.

IT is now several years since full accounts of the prevalence studies of mental disorders carried out in the early fifties have been released to public view. Arising in part from the concern over the large number of rejections and discharges from the armed forces for psychiatric causes during World War II, their endeavor to lay a "base line" of total psychiatric illness was intended to demonstrate, at one and the same time, the magnitude of the mental health problem in the population and the social determinants of psychiatric disorder. Such information, it was believed, would serve to facilitate more rational planning for mental health programs throughout the nation.

These prevalence studies were followed in 1955 by the creation of the Joint Commission on Mental Illness and Health whose five-year study of psychiatric care in the United States¹ recognized a "constantly growing burden" of mental disease and pleaded for solution. In 1963, as a direct outcome of the report of the Joint Commission, passage of the Community Mental Health Centers Act laid the legislative and fiscal framework for establishing

a community-based system of psychiatric services available to a defined population residing in a specified "catchment" area.

In proposing the functions of the community mental health centers, the National Institute of Mental Health has indicated the desirability of investigating the prevalence of mental disorders in the areas served by the centers, so that programmatic development relating to mental health could be planned in accordance with the needs of the population. Since prevalence studies of mental disease in the community are complex, time-consuming, and expensive, it is appropriate once again to review the problems confronted in such research, and to assess its justification.

International Variations

Many investigators have been concerned, since the 1930's, with the total prevalence of psychiatric abnormality in the population. Dunham² points to ten studies throughout the world that have attempted an accounting of all such disorders. The rates for significant mental disorders quoted by Dunham range

from a minimum of 23 per 1,000 in Eaton and Weil's 1951 survey of the rural Hutterites, to a maximum of 370 per 1,000 in D. C. Leighton's analysis in 1955 of the "firm core" of mental disorder in a small Canadian town—a 16-fold difference in rates. Dunham also presents the rates for all psychosis and for schizophrenia found in ten European, five Asiatic, and six North American surveys conducted between 1929 and 1959. For total psychosis, a maximum rate of 90 per 1,000 was reported from rural Scotland in 1948 by Mayer-Gross, and a minimum rate of 3.8 per 1,000 was found in as widely disparate places and times as Thuringia in 1929 by Brugger, and Formosa in 1948 by Lin. This represents a 25-fold difference. Schizophrenia rates seem to vary less. The maximum rate of 9.6 per 1,000 was claimed by Bök for northern Sweden in 1949; the minimum rate of 1.0 per 1,000 was reported by Eaton and Weil in their Hutterite study. The difference between the two rates is tenfold. On the other hand, there exists an inconstant relationship of the rates for total psychosis to those for schizophrenia. In Kaila's series from Finland in 1936, two out of three psychoses are considered to be schizophrenic, while Mayer-Gross reports that only one out of 25 psychotics bears that diagnosis.

It is often argued that some of the differences in rates are due to variations in composition of the populations surveyed. In the continental United States as compared with Puerto Rico, for example, the rates for chronic brain syndrome due to cerebral arteriosclerosis would undoubtedly be higher because of the disproportionate number of older people in the continental population. The experience of Selective Service in World War II shows, nevertheless, that even when demographic characteristics are similar, the differences in the rates remain. Thus, the psychiatric

rejection rates for recruits called up for military duty in August, 1945, showed considerable variation among different parts of the country, ranging from 0.5 to 51 per cent of selectees. Terris³ points out that for the country as a whole, 40 per cent of all psychiatric rejectees were diagnosed as psychoneurotic, while for individual stations the proportions varied all the way from 3 to 90 per cent. He believes that the variability in diagnosis probably did not reflect disparities in actual prevalence because "the variations were as great within regions as between regions. In Pittsburgh, 24 per cent of the men examined were psychiatric rejects, as compared with only 7 per cent in Philadelphia. In Detroit, the rate was 22 per cent, but in Chicago, only 8 per cent. In Seattle and Portland, it was 16 per cent, but in San Francisco, only 5 per cent."

If population differences do not fully account for the discrepant rates for mental illness, what other explanations can be offered? In the following sections the concepts and methods involved in the two best-known American studies will be more fully explored to find possible explanations.

Recent American Surveys

A psychiatric case-finding survey of Stirling County, a rural area with a population of 20,000 in eastern Canada, was carried out by A. H. Leighton and his co-investigators from Cornell University between 1951 and 1962.⁴⁻⁶ The object was "to explore the meaningful relations between the distribution of psychiatric illness and the distribution of sociocultural factors" by relating prevalence rates to such factors.⁷

The data on which the various rates and interrelations of the Stirling County survey are based were collected on 1,010 persons constituting a 10 per cent systematic sample weighted toward heads of households. Residents of Bristol, the

county seat, were sampled more heavily. Multiple technics and sources of information were used in the assessment of the psychiatric status of the subjects: questionnaires on personal, social and family characteristics, interviews to determine health and medical history and psychiatric symptoms, psychological inventories, institutional records of lifetime illness, impressions of local physicians and other figures in the community, findings in a psychiatric clinic, observations by interviewers, and finally, evaluative classifications by a group of psychiatrists. Aside from the evaluations which were made in all cases, the remaining sources varied according to the phase of the survey, the nature of the immediate interest, and the availability of the information. As pointed out by the authors,⁶ the quality and nature of the data also varied due to factors relating to the interviewer, the respondents, and the circumstances.

Four categories were established to represent gradations of certainty that the subject was indeed a psychiatric case:

1. Symptoms almost certainly indicative of psychiatric disorder (been in a mental hospital, had a nervous breakdown, or described anxiety attacks).
2. Symptoms probably indicative of psychiatric disorder (asthma, ulcer, colitis, allergic conditions, hypertension, "dyspepsia," sociopathic behavior, and the like; or where symptoms vaguely or inconclusively suggested psychoneurosis or psychosis).
3. Symptoms which might be indicative of psychiatric disorder, a borderline category (exploratory operations, hysterectomies, thyroidectomies, neuralgias, chronic constipation, "not yet diagnosed," or others).
4. No evidence of symptoms suggesting psychiatric disorder (appendectomies, amputations, childbirth, and the like).

These categories of "caseness" (i.e., the probability of being a psychiatric case) were reclassified according to the degree of impairment, and still once again according to a new typology. The last summarized several attributes of psychiatric status in one rating reflect-

ing "caseness," impairment, prognosis, and need for psychiatric care. Types I, II, and III, from severely to moderately abnormal, constitute roughly three-fifths of the respondents and Type IV, mildly abnormal, about one-quarter. Type V, the probably well group that is rated lowest in need for psychiatric attention, comprises less than one-fifth of the sample.

In contrast to Leighton's research into psychiatric symptoms in a rural area, a group headed by Dr. Thomas A. C. Rennie of Cornell Medical School undertook an investigation of mental health in an urban population, a subcommunity of New York City comprising 180,000 residents.^{8,9} Case finding was conducted through an institutional search and an inquiry of private practitioners for residents of that area, and also through home interviews by means of a structured schedule of a 1.5 per cent probability sample of the population of the area aged 20 to 59 years. This sample comprised 1,660 individuals. The interviewers were professionals with backgrounds in psychiatric social work, clinical psychology, social case work, and social science. Special instructions were given the interviewers "not only to record the respondent's answer to each prepared question and his spontaneous elaborations and asides, but to report observations of his behavior and to probe replies and comments that were either ambiguous or suggestive as possible openings to matters of further significance."

The questionnaire included questions relating to the following areas:

1. History suggesting the probability of recent mental pathology ("nervous breakdown," seeking psychotherapy, epilepsy, and so on).
2. Gross somatic disorders often attributed to a psychogenic basis (arthritis-rheumatism, asthma, colitis, diabetes, hayfever, heart conditions, hypertension, hives or rashes, neuralgia-sciatica, and stomach ulcer).

3. Psychophysiologic manifestations (nervousness, restlessness, fainting spells, headaches, back pains, hand tremors, cold sweats, damp hands, feeling hot all over, insomnia, appetite and digestive disturbances, shortness of breath, heart palpitations, neurasthenia, and excessive intake of coffee, food, tobacco or liquor).
4. Memory difficulties reported by the respondent, and interpreted by the interviewer.
5. Interpersonal functioning within the social settings of family, work, and peer groups.
6. Intrapsychic functioning (anxiety, inadequacy, depression, rigidity, immaturity, withdrawal, and suspiciousness).
7. Childhood disturbances comprising 28 selected signs reported retrospectively.

All information pertaining to each respondent was reviewed and rated by two psychiatrists. Besides the questionnaire, this included:

1. The respondent's free-association elaborations and asides, spontaneous or elicited by the interviewer's probes, sparse or voluminous as the case might be. "Such added comments often proved significant in the clinical judgments of the psychiatrists."
2. A systematic descriptive outline of observations specially prepared for the psychiatrists by the interviewer, covering various aspects of the respondent's behavior including tension or ease, affect, level of intelligence, appearance, speech or memory difficulties, and physical disabilities.
3. Relevant data from the records of institutions and practitioners.
4. Information from the records of the New York City Social Service Exchange providing a history of personal or family problems.

Each psychiatrist independently prepared mental health ratings from the summary provided for each respondent by the interviewers. These were graded according to the degree of symptom formation and impairment. Differences between the psychiatrists were resolved by consensus.

Based on final ratings, the Midtown investigators report that less than a fifth of the 1,660 respondents are well, about a third have mild and another fifth have moderate symptoms, and about a quarter are more severely impaired.⁹ Comparison with the Stirling

County study for roughly similar categories indicates the following distribution:

Grade	Per cent	
	Stirling County	Midtown
Well	17	18
Mild	26	36
to moderate	37	22
Severe	17	13
	6	3

} 63
 } 58
 } 24

For the major groupings—well, mild to moderate, and severe—it is strikingly apparent that close agreement between these two studies exists despite the obvious differences in population characteristics relating to urban-rural distribution, ethnic background, and sociocultural factors. Does concordance between the two studies confirm the validity of these high rates and the huge estimates of need for psychiatric care implicit in them? An affirmative reply leads to incalculable problems of organization, manpower, and administration. This imposes an obligation to determine whether the reported rates are, indeed, fact or artifact.

Assessing the Findings

In assessing the validity of findings in any research, both the underlying assumptions and the methods for testing them must be thoughtfully scrutinized. In the two studies summarized in the foregoing sections, some major methodologic procedures and basic assumptions deserve review.

The first consideration is whether or not the methods used in the research are appropriate for achieving its aims. Both studies use prevalence data with the intent of establishing significant, implying causal, relationships between social factors and psychiatric disorder. The arguments put forth in favor of this procedure are that incidence data are im-

possible to obtain because of the difficulty in determining the date of onset of mental illness, and that prevalence and incidence in psychiatric disorder are not very different since this is a once-in-a-lifetime illness of indefinite duration with a permanent risk of breakdown. The latter view, incidentally, made it possible for the Stirling County group to adopt the concept of "lifetime" prevalence and therefore to include currently inactive as well as active cases in their count.

Prevalence rates measure the size of the disease problem and as such are useful in planning services. They are, however, a fallible indicator of the risk of acquiring any chronic disease including psychiatric disorder.¹⁰ Since prevalence is a function of incidence and duration, any factors affecting duration of disease will similarly influence its prevalence rate. Thus, long-term, nonfatal, noncurable diseases which limit migration produce a pile-up of cases and a rise in the prevalence rates. Survivorship, mobility, and duration may, in turn, be associated with demographic factors. Consequently an association between these factors and prevalence may occur even though demographic factors bear no relationship to the genesis of disease. The only suitable measure applicable to the search for possible causes of disease is the incidence rate.

Another issue is whether or not error is introduced into the results through bias from any source. Such bias may produce overcounts or undercounts of positive findings, resulting in false rates. In the two studies, the methods used in collecting data are particularly worthy of examination. Bias is a serious hazard when respondents are questioned by psychiatrically sophisticated interviewers with a preconception of psychopathology. The risk is increased when these interviewers are permitted to probe the respondents' answers at will, and is fur-

ther heightened when the probes, impressions, and summaries of the interviews serve as the basis upon which the psychiatrist classifies the respondent as well or ill. Evidence bearing on this point comes from a British study of the epidemiology of respiratory symptoms, where it was found that the combined effect of sophisticated interviewers, lengthy interviews, and unlimited probes tends to result in the overenumeration of positive findings.¹¹

A further source of error is the absence of uniformity in the quantity and quality of the data upon which classification is based. There can be no doubt that different kinds and amounts of information are produced by interviews of varying length and by the use of variable materials from variable sources. All such departures from rigorous and objective methods contribute error to the results. Although the effects of such error cannot be fully assessed, the lack of uniform data collection renders the rates unreliable.

In both studies the investigators believe their rates underestimate the actual occurrence of positive findings. In spite of any bias and other errors of method which may have distorted the rates, there may well exist in any community a high level of signs and symptoms which reflect physical and emotional discomfort and are associated with a greater or lesser degree of impairment in efficiency of living. If this is true, does it signify a high level of psychiatric disorder? This question poses the fundamental issue of what is a case. More than a decade ago a group of leading psychiatrists and social scientists¹² attempted to formulate the definition of a case, but were unable to reach a consensus. A case was a person who, in relation to some sort of norm, failed to achieve goals or to live up to expectations, made or had trouble, or demonstrated inappropriate behavior. One participant asked whether a case

should be defined as a person, a family, a school, or a situation. Another stated, "A case is a person, because every person is involved in a continuous process of adaptation to a stressful environment." The last comment was made by Dr. T. A. C. Rennie, at that time director of the Midtown study.

Validity of Diagnosis

The definition of a case determines who is included in an incidence or a prevalence study and influences strongly the identification of causal factors. If all persons who cough are counted as cases of tuberculosis, both incidence and prevalence rates will skyrocket. Fortunately, the laboratory provides a safeguard against that kind of diagnostic extravagance. Psychiatric diagnosis as yet has no such safeguards. On the contrary, it rests on a highly nonobjective method, the clinical judgment of the psychiatrist. Sometimes this judgment is supplemented by a psychological test. Then the question is whether or not the test really measures what its interpreter believes it does. Stevens¹³ warns of the dangers of interpreting psychological dimensions through their presumed effects: "We measure changes in the resistance of the skin and call it an indicant of emotion."

There can be no doubt that Rennie's definition, "a case is a person," asserts the belief that the spectrum of the human psyche is made up of a wide band of psychopathology and a narrow band of normality.¹⁴ Such a definition creates a self-fulfilling prophecy. It makes inevitable the high rates for psychiatric disorder in two communities of widely differing characteristics. Since both teams of investigators essentially accept the Rennie definition of a case, the concordance of rates should come as no surprise.

The distribution of rates for the symptom complexes in the two studies is an-

other indicator of the wide band of psychopathology accepted by the investigators. When approximately comparable categories of symptom complexes are examined, only about a fifth of the respondents in the two studies show signs and symptoms suggestive of psychosis, mental deficiency, brain syndrome, sociopathic behavior or personality disorder, while the majority of those remaining present only psychoneurotic symptoms or psychophysiological complaints or a mixture of both. D. C. Leighton⁷ also points out that the presence of many psychophysiological complaints may have influenced the evaluators to regard such a person as psychoneurotic even in the absence of marked psychoneurotic symptoms.

Physical diseases and symptoms which are interpreted as having a psychological origin constitute the largest contribution to the rates for psychiatric disorders in both studies. The rationale for this is presented by the Stirling County authors in the words of Hans Selye,⁸ "We are just beginning to see that many common diseases are largely due to errors in our adaptive response to stress, rather than to direct damage by germs, poisons or other external agents. In this sense many nervous and emotional disturbances, high blood pressure, gastric and duodenal ulcers, certain types of rheumatic, allergic, cardiovascular, and renal diseases appear to be essentially *diseases of adaptation*."

Although theoretical grounds are often advanced for including the so-called diseases of adaptation within the spectrum of psychiatric disorder, there is little if any firm evidence as yet available from well controlled experimental, clinical or epidemiologic studies to substantiate the hypothesis that stress or any other psychogenic agency is the sole or primary cause of these diseases. Their classification as psychiatric disorders is therefore disputable. In the past, psycholog-

ical origins were postulated for general paresis and for pellagra. Other diseases whose cause is still unknown and which are now explained, as it were by default, by psychogenic mechanisms, may likewise need to be reclassified when their etiology is demonstrated.

The enormous world-wide disparities in prevalence rates cited earlier reflect not only the variety of methods used in collecting data and differences in the classification of disease, but variations in diagnostic criteria as well. Absence of uniform classification and diagnostic criteria reduces the utility of diagnosis as an indicator of the prevalence of mental disease.

The consistency of psychiatric diagnosis has received considerable attention. The Midtown investigators found that pairs of psychiatrists agreed most when symptoms were severe, and least at the "subclinical level of symptomatology." The analysis of diagnostic consistency elsewhere is not very encouraging. Four decades ago, Elkind and Doering¹⁵ found that for psychiatric illnesses severe enough to require hospitalization, the diagnosis made on patients admitted to a receiving hospital was changed in 42 per cent of the cases when these patients were transferred to a state hospital. Twenty years later Ash¹⁶ compared the diagnoses made on psychiatric clinic patients by three psychiatrists, and found that there was agreement among all three in 46 per cent of the cases for the major diagnostic groupings, and in only 20 per cent for the specific or secondary diagnoses. Agreement was also higher when only two psychiatrists were involved than when three were compared. About five years ago Babigian, et al.,¹⁷ studied the consistency of diagnosis in Monroe County, New York. The results indicated that agreement is highest when functional and organic psychoses are diagnosed, when not more than two psychiatric contacts are involved, when

the diagnostic criteria are most clear-cut, and when the patient's condition is most stable.

The evidence on diagnostic consistency casts further doubt on the acceptability of the criteria by which the most variable and inconsistent diagnostic groups were included as cases and swelled the prevalence rates in the Stirling County and Midtown studies.

Conclusions

To return now to the original question posed: Should community mental health centers engage in prevalence studies to determine the magnitude of the mental health problem in their designated areas? The answer must be in the negative. Until the criteria for diagnosis are freed from bias or whim and are standardized, the validity of the rates for psychiatric disorder will remain questionable. Prevalence studies under these circumstances have little value as a guide to the planning of services. Additionally, rates which include a large proportion of equivocal or mild cases, or actually nonsick individuals, may even have the deleterious effect of encouraging the deployment of the limited mental health forces for the treatment of those who are least sick and have the best prognosis.¹⁸

There is, furthermore, no particular need for prevalence studies. First, as discussed earlier, they are of no value in uncovering possible etiologic relationships. Second, their utility is dubious: from a practical point of view the community mental health centers will have difficulty for many years to come in saturating their "catchment" areas with enough services to meet the needs of those with more severe mental illness.

The main contribution of epidemiology is not, in any event, to be found in discovering the prevalence of disease. It lies in the search for the cause of disease. For this search, the main tool is

the incidence rate. To determine the incidence of psychiatric disorder, to relate the incidence to environmental and biological characteristics, to use inferences from these relationships as clues to etiology, and thereby to lay the basis for the prevention and control of disease—these are the tasks of epidemiologic research in mental disorder. The first step along this road is to develop uniform criteria for the definition of a case.

REFERENCES

1. Joint Commission on Mental Illness and Health. Action for Mental Health. New York: Basic Books, 1961.
2. Dunham, H. W. Community and Schizophrenia. An Epidemiological Analysis. Detroit, Mich.: Wayne State University Press, 1965.
3. Terris, M. Discussion of Macmillan, A. M. "A Survey Technique for Estimating the Prevalence of Psychoneurotic and Related Types of Disorders in Communities." In: *Epidemiology of Mental Disorders*. Washington, D. C.: American Association for the Advancement of Science, 1959.
4. Leighton, A. H. My Name Is Legion. Vol. I. The Stirling County Study of Psychiatric Disorder and Sociocultural Environment. New York: Basic Books, 1959.
5. Hughes, C. C.; Tremblay, M.-A.; Rapoport, R. N.; and Leighton, A. H. People of Cove and Woodlot. Vol. II. The Stirling County Study. New York: Basic Books, 1960.
6. Leighton, D. C.; Harding, J. S.; Macklin, D. B.; Macmillan, A. M.; and Leighton, A. H. The Character of Danger. Vol. III. The Stirling County Study of Psychiatric Disorder and Sociocultural Environment. New York: Basic Books, 1963.
7. Leighton, D. C. The Distribution of Psychiatric Symptoms in a Small Town. *Am. J. Psychiat.* 112: 716-723, 1956.
8. Srole, L.; Langner, T. S.; Michael, S. T.; Opler, M. K.; and Rennie, T. A. C. Mental Health in the Metropolis: The Midtown Manhattan Study. Vol. II. New York: McGraw-Hill, 1962.
9. Langner, T. S., and Michael, S. T. Life Stress and Mental Health: The Midtown Manhattan Study. Vol. II. Glencoe, Ill.: Free Press, 1963.
10. Kramer, M. A Discussion of the Concepts of Incidence and Prevalence as Related to Epidemiologic Studies of Mental Disorders. *A.J.P.H.* 47:826-840, 1957.
11. Fairbairn, A. S.; Wood, C. H.; and Fletcher, C. M. Variability in Answers to a Questionnaire on Respiratory Symptoms. *Brit. J. Prev. & Social Med.* 13:175-193, 1959.
12. Symposium: "Definition of a Case for Purposes of Research in Social Psychiatry." In: *Interrelations Between the Social Environment and Psychiatric Disorders*. New York: Milbank Memorial Fund, 1953.
13. Stevens, S. S. "Mathematics, Measurement, and Psychophysics." In: *Handbook of Experimental Psychology*. New York: Wiley, 1951.
14. Lapouse, R. Discussion of Srole, L., and Langner, T. "Treated and Untreated Mental Disorder in the Metropolis." In: *Epidemiology of Mental Disorder*. Washington, D. C.: American Association for the Advancement of Science, 1959.
15. Elkind, H. B., and Doering, C. G. Cited by Gruenberg, E. M. In: *Epidemiology of Mental Disorder*. New York: Milbank Memorial Fund, 1950.
16. Ash, P. The Reliability of Psychiatric Diagnosis. *J. Abnorm. & Social Psychol.* 44:272-276, 1949.
17. Babigian, H. M.; Gardner, E. A.; Miles, H. C.; and Romano, J. Diagnostic Consistency and Change in a Follow-Up Study of 1215 Patients. *Am. J. Psychiat.* 121:895-901, 1965.
18. Lapouse, R. Who Is Sick? *Am. J. Orthopsychiat.* 35:138-144, 1965.

Dr. Lapouse is professor of preventive medicine and psychiatry, New York Medical College (Fifth Avenue and 105th St.), New York, N. Y. 10029.

This paper was presented before a Joint Session of the Conference of Chronic Disease Training Program Directors of Schools of Public Health and the Epidemiology Section of the American Public Health Association at the Ninety-Fourth Annual Meeting in San Francisco, Calif., November 3, 1966.